

**Karner Blue Butterfly Management On
Necedah National Wildlife Refuge
2012**



(An Annual Report Submitted to the U. S. Fish and Wildlife Service's
Green Bay Field Office)

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August 30, 2012

INTRODUCTION

This report is being submitted to the U.S. Fish and Wildlife Service's Green Bay Field Office to fulfill reporting obligation stipulated in a Biological Opinion issued by the Green Bay Field Office. This report insures that the Necedah National Wildlife Refuge is implementing the "Reasonable and Prudent Measure" outlined in the Biological Opinion.

Necedah National Wildlife Refuge has added two permanent refugia for Karner blue butterflies; now total four (4). The new refugia are known as the Goose Pool and East Sprague E Sites and contains portions of Prairie Restoration Units 13, 14, & 18 (See Figure 1). Although peer-reviewed research has demonstrated that there is no need for no-burn set-aside areas (refugia), the Refuge is incorporating four refugia as an additional conservation. Figure 1 also illustrates the location of all burn units with Karner blue butterfly populations on Necedah National Wildlife Refuge

The reported items below correspond to the "Terms and Conditions" Section (p. 24) of the Biological Opinion.

- 1) **Condition #2 - Annual Surveys** – The Refuge completed its twentieth year of Karner blue butterfly surveys in 2012. However, due to lack of funding, Refuge-wide surveys were not conducted in 2012. As a result, some 2012 population estimates could not be made. Results for each Karner blue butterfly complex where surveys were conducted are provided in Table 1. Based on these results alone, Necedah National Wildlife Refuge is above the recovery goal (Table 3). These units total just 248.93 acres. The Refuge has an additional 3,805 acres of occupied habitat (Figure 1).

Karner blue butterfly surveys and population estimates were performed using the following methods:

- a) Pollard-Yates type surveys were conducted on each Karner blue butterfly site at least three times during the peak of second flight. At least seven day spacing between the surveys was used. Results of the three counts were summed.
 - b) "Distance" methodology was used to determine the density of Karner blue butterflies at each site.
 - c) The density was then multiplied by the size of each unit, which was determined with Geographic Information Systems (GIS) technology.
 - d) A Refuge wide population estimate for the Refuge in 2012 was 68,092 adult Karner blue butterflies.
- 2) **Condition #3- Management Activities (Units Treated in 2012)**- The Refuge prescribe burned Prairie Restoration Units 15, 16, 25, 28, 28A, 28B, 29A, & 31 and Oak Savanna Restoration Units 15& 27 in 2012. Portions of Prairie Restoration Units 28, 28A, 28B, 29, & 31 and Oak Savanna Restoration Units 33 & 6 along with Farm Field Units 7, 8, & 9

and Ducks Unlimited Unit 4 were mowed in 2012. Portions of Oak Savanna Restoration Units 9A, 9B, and 9C were herbicide treated in 2012.

Figure 1. Karner blue butterfly occupied habitat on Necedah National Wildlife Refuge.

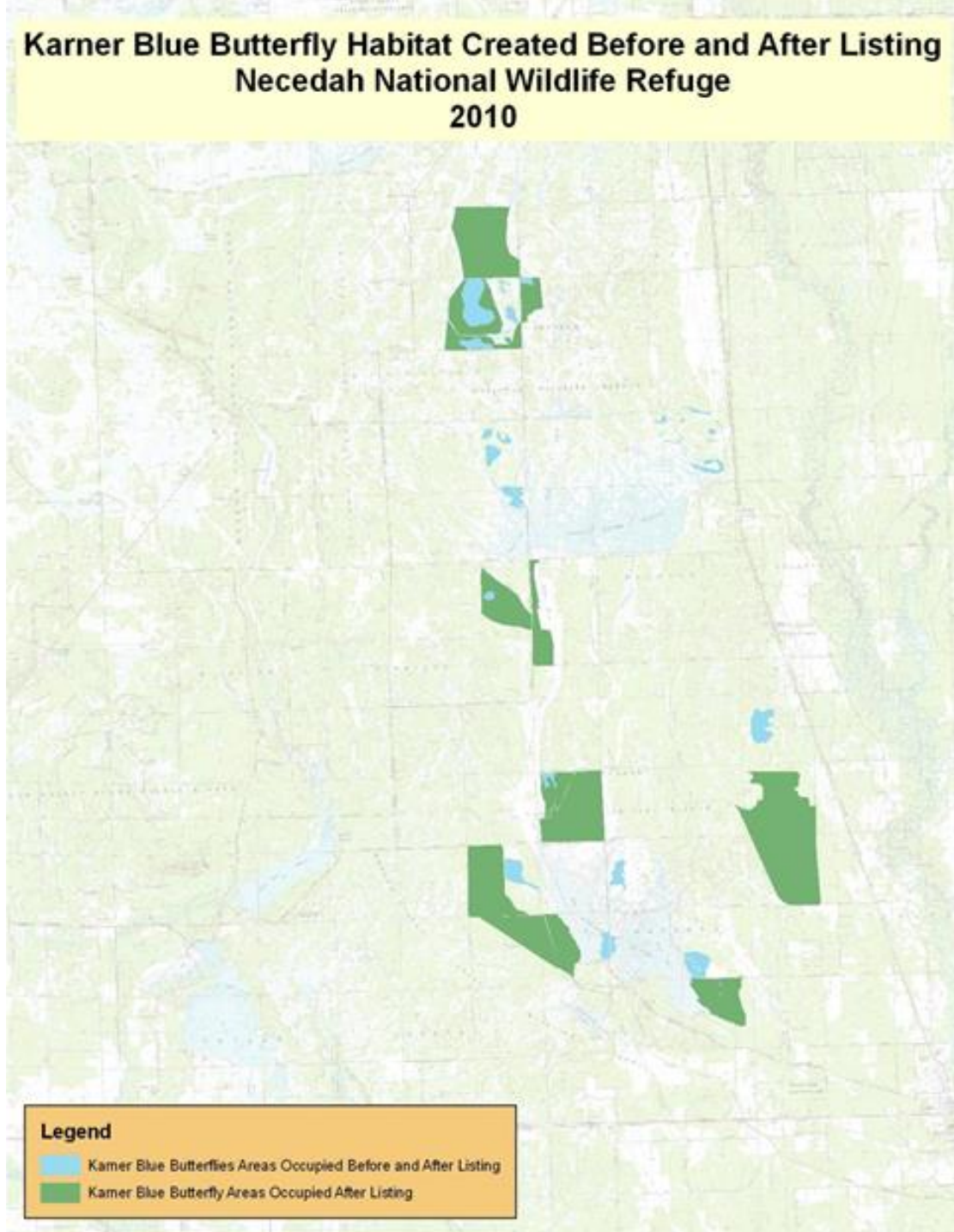


Figure 2. Units Treated in 2012. Illustration of treated units (full or partial) with Karner blue butterflies on Necedah National Wildlife Refuge.

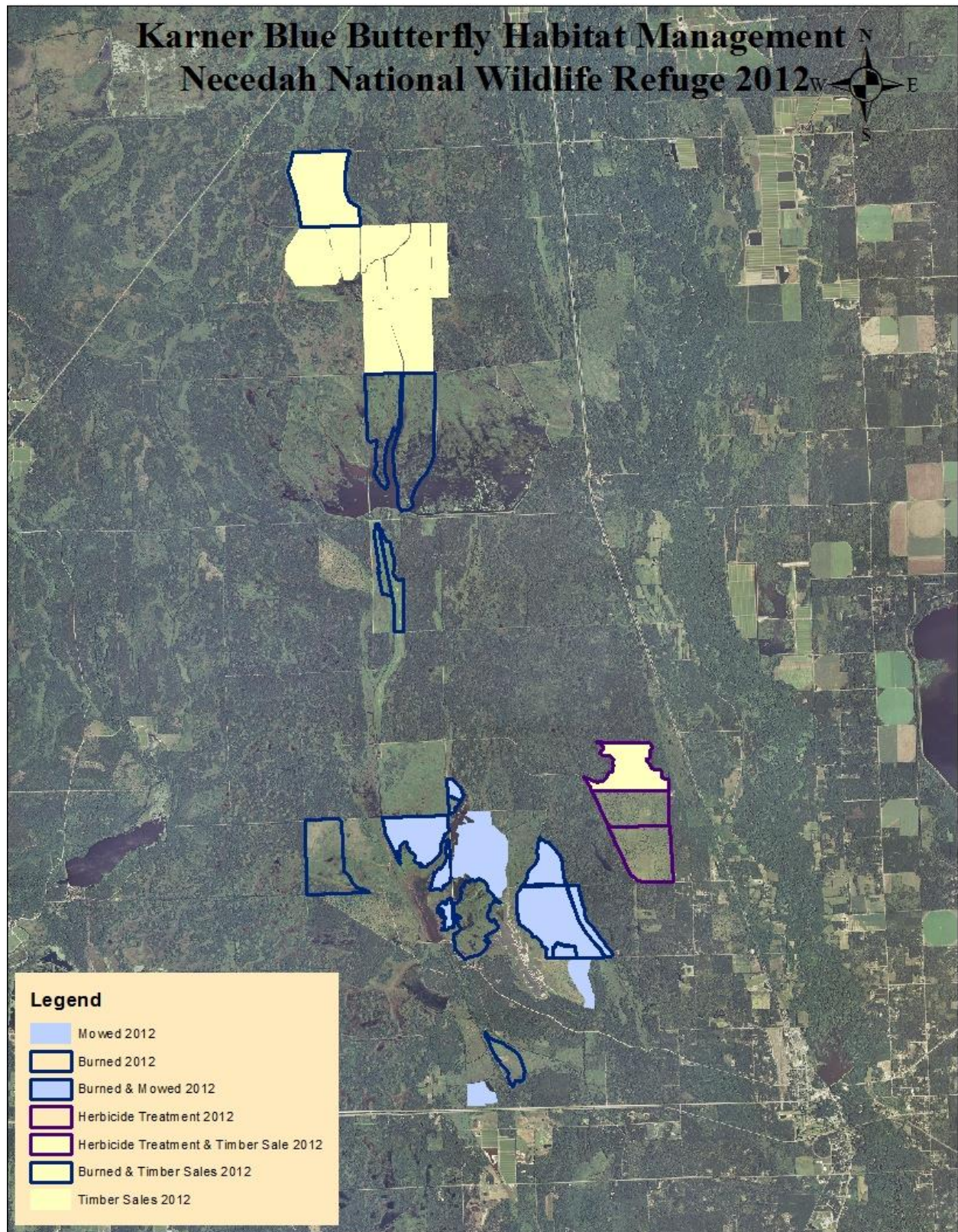


Table 1. 2012 Karner Blue Butterfly Survey Results For Necedah National Wildlife Refuge

Burn Unit	Complex Name	Complex Size (acres)	KBB Counted
Prairie Restoration Unit #29A	South Rynearson A	7.24	38
	South Rynearson B	8.17	26
Prairie Restoration Unit #28B	South Rynearson C	12.13	46
Prairie Restoration Unit #27	Cranberry Loop	86.14	N/A
Barrens Restoration Unit #30	Barrens Restoration Unit #30	76.90	N/A
Prairie Restoration Unit #29	East Rynearson A	22.39	5
Oak Savanna Unit 33	East Rynearson A	60.37	10
	East Rynearson B	7.98	30
Prairie Restoration Unit #32	East Rynearson C	26.86	2
Barrens Restoration Unit #5	Barrens Restoration Unit #5	113.34	N/A
Barrens Restoration Unit #6	Barrens Restoration Unit #6	80.97	N/A
Barrens Restoration Unit #27	Barrens Restoration Unit #27	160.96	N/A
Prairie Restoration #23	Prairie Restoration Unit #23A	17.94	N/A
Not in Burn Unit	East Sprague A	0.82	N/A
Prairie Restoration Unit #19	East Sprague B	3.39	10
	East Sprague C North	5.07	97
	East Sprague C South	4.87	37
Prairie Restoration Unit #20	East Sprague D East	2.57	28
	East Sprague D West	4.32	74
	East Sprague F	19.72	85
Prairie Restoration Unit #18	East Sprague E	14.73	33
Prairie Restoration Unit #3	Prairie Restoration Unit #3	31.78	N/A
Prairie Restoration Unit #14	Goose Pool A	10.40	17
Prairie Restoration Unit #13	Goose Pool B	38.72	18
Barrens Restoration Unit #10	Old Barrens	13.79	N/A
Prairie Restoration Unit #21A	Prairie Restoration Unit #21A	2.42	N/A
Prairie Restoration Unit #4	Prairie Restoration Unit #4	7.71	N/A
Prairie Restoration Unit #1	Prairie Restoration Unit #1	121.89	N/A
Barrens Restoration Unit #22	Barrens Restoration Unit #22	12.26	N/A
Barrens Restoration Unit #15	Barrens Restoration Unit #15	4.77	N/A
Prairie Restoration Unit #2	Prairie Restoration Unit #2 Big	36.96	N/A
	Prairie Restoration Unit #2 Little	22.02	N/A
Barrens Restoration Unit #28	Barrens Restoration Unit #28	206.38	N/A
Suk Cerney	Meadow Valley #1		N/A
	Meadow Valley #2		N/A
N/A= No Counts in 2012			

Table 2. Karner blue butterfly complex size, lupine acres, and burn history at Necedah National Wildlife Refuge. *This table is the same as Appendix B in Necedah National Wildlife Refuge's Biological Opinion dated May 4, 2001

Complex	Size (acres)	Burn Unit(s) within Complex	Years Unit was Prescribe Burn
South Rynearson	19.5	PR-29A	1961;63;64;67;69;71;73;78;81;88;94;2012
		PR-28B	1970;75;80;83;87;91;2012
North Rynearson	14.3	PR-29	1961;63;64;67;69;71;73;78;83;88;92;99;2002;04;08
Old Barrens	15.3	BRU10	This unit was last burned by wildfire in 1954
Goose Pool	27.4	PR-14	1973;74;75;79;85;87;92;98;2011
		PR-13	1973;75;79;85;87;91;97;98;99;2003;06
East Sprague	27.9	PR-18	1967;72;75;79;82;97;94;98;2001;06;08
		PR-19	1970;73;75;80;87;2003;07;08;10;2011
		PR-20	1969;72;75;80;87;94;2003;07;10;2011
East Rynearson		<i>BRU-5</i>	1998;99;2001;03;05;07;2010
		<i>BRU-6</i>	1998;99;2001;03;05;07;2010
		OSR-33	1966;69;72;80;86;89;94;98;99;2001;04;09;2012
		PR-32	1972;73;75;77;81;85;86;89;98;99;2001
West Rynearson	208.6	PR-27	1970;75;78;82;87;91;93;95;97;99;2002;03;07;09;2011
		<i>BRU-30</i>	2001;02;03;05;06;08;2010
		<i>BRU-28</i>	2003;05;07;09
		<i>BRU-27</i>	2003;05;07
Research Natural Area	13.6	BRU-22	1966;68;74;2009
Clauson Burn	5.3	BRU-15	This unit was last burned by a wildfire in 1963
Pool 19	35.8	PR-3	1973;76;87;93;2002;07;2011
		PR-2	1974;93;2002
		PR-1	1974;93;2002;07
		PR-4	1974;92;96;2004;06;10
Middle Refuge	8.3	PR-23	1973;74;78;93;96;2001;02;03;05;08;09;10
		PR-21A	1973;75;77;78;82;96
* <i>Italics</i> indicates newer savannas that are not fully restored			

Table 3. Burn history and Karner blue butterfly population levels on Necedah National Wildlife Refuge. *This table is the same as Appendix C in Necedah National Wildlife Refuge's Biological Opinion dated May 4, 2001.

Complex Name	Size (acres)	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
South Rynearson	19.5	685	682	353	1,361	1,482	155	345	719	1,322	512	1,139	633	708	1,194	954	975	1,376	2,618	1,079	2,441
North Rynearson	14.3	211	314	838	521	179	0	0	146	169	113	159	0	83	131	518	1123	246	N/A	502	325
Old Barrens	15.3	N/A	299	624	519	84	26	104	0	0	0	0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Goose Pool	27.4	160	215	501	865	282	1,249	3,861	1,952	501	4,172	2,127	1,882	913	143	1,207	12,238	3,398	2,158	723	1,513
East Sprague	27.9	278	536	1,263	3,896	993	669	844	955	1,679	5,906	2,701	2,543	1,022	797	1,615	1,578	3,463	1,933	923	8,076
East Rynearson*	289.6	359	199	105	157	131	310	115	253	428	346	110	251	658	220	102	35	0	253	2,453	1,134
West Rynearson+	530.3	N/A	N/A	N/A	N/A	N/A	N/A	298	153	2,799	1,571	2,135	1,217	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Research Natural Area	13.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	22	0	0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pool 19#	225.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	660	1,027	6,615	3,202	470	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Middle Refuge	21.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	171	187	639	399	877	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*East Rynearson Complex included East Rynearson Units A,B, & C as well as Barrens Restoration Units 5 & 6, which are newer units.

+West Rynearson Complex includes Cranberry Loop and Barrens Restoration Units 27, 28, & 30, which are all newer units.

#Pool #19 Complex includes Prairie Restoration Units 1, 2, 3, & 4 as well as Barrens Restoration Unit 15 (Clauson Burn).

N/A = Data were not collected.

Bolded and **highlighted** items indicate year all or portion of complex was prescribe burned. See Table 2 for burn information specific to prescribe burn units

Table 4. Prescribed burn dates and management history for eight savanna restoration units where restoration activities were initiated after federal listing of the Karner blue butterfly

Year	OSR 5	OSR 6	OSR 30	OSR 27	OSR 28	OSR 22	OSR 15	OSR 9
1995	Uncut	Uncut	Uncut	Uncut	Uncut	Uncut	Uncut	Uncut
1996	Timber Harvest	Timber Harvest	Uncut	Uncut	Uncut	Uncut	Uncut	Uncut
1997	Timber Harvest	Timber Harvest	Uncut	Uncut	Uncut	Uncut	Uncut	Uncut
1998	April	April	Uncut	Uncut	Uncut	Uncut	Uncut	Uncut
1999	May	May	Timber Harvest	Timber Harvest	Uncut	Uncut	Uncut	Uncut
2000	Untreated	Untreated	Untreated	Untreated	Uncut	Uncut	Uncut	Uncut
2001	April	April	April	Untreated	Uncut	Uncut	Uncut	Uncut
2002	Untreated	Untreated	May	Untreated	Timber Harvest	Uncut	Uncut	Uncut
2003	April	June	April	May	June	Uncut	Uncut	Timber Harvest
2004	Untreated	Untreated	Untreated	Untreated	Untreated	Uncut	Uncut	Timber Harvest
2005	May	May	May	November	November	Uncut	Timber Harvest	April
2006	Untreated	Untreated	October	Untreated	Untreated	Timber Harvest	Timber Harvest	Untreated
2007	April	April	Untreated	May	May	Timber Harvest	Timber Harvest	April
2008	Untreated	Untreated	April	Untreated	Untreated	Timber Harvest	Timber Harvest	Untreated
2009	Untreated	Untreated	Untreated	Untreated	May	May	Untreated	Untreated
2010	March Herbicide	May Herbicide	May Herbicide	Herbicide Mowing	Herbicide	Untreated	Untreated	May/June Herbicide
2011	Herbicide	Herbicide	Herbicide	Burn (May)/ Mowing	Burn (May)	Burn (June)/ Mowing	Untreated	Herbicide
2012	Untreated	Mowed	Untreated	Burn (April)	Untreated	Untreated	Burn (April)/ Timber Harvest	Timber Harvest

Figure 3. Karner blue butterfly population estimate for Necedah National Wildlife Refuge. *Population estimate is obtained by applying density on surveyed units to unsurveyed units. The surveyed units represent approximately 10% of the Refuge's occupied habitat.

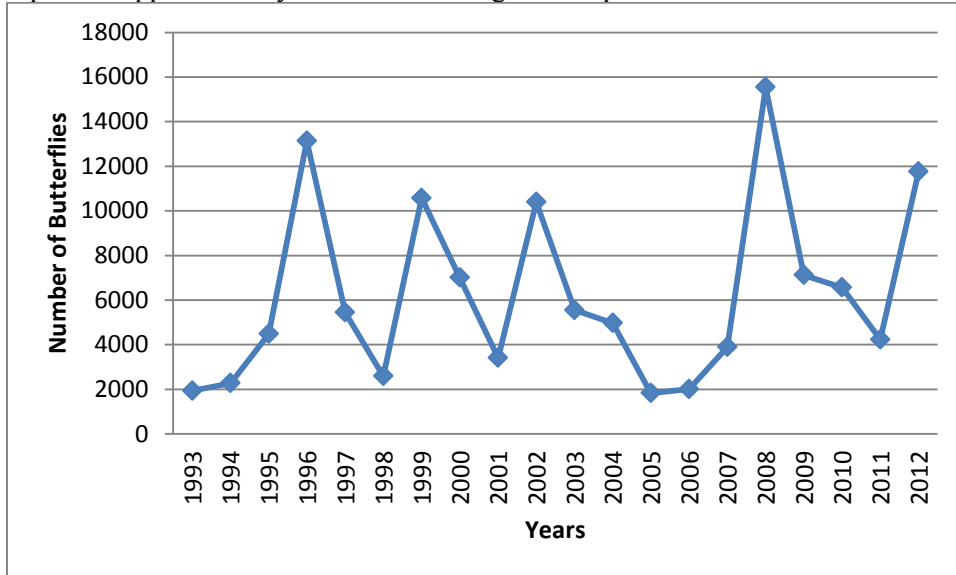


Figure 4. Estimation of the population of Karner blue butterflies in survey plots at Necedah National Wildlife Refuge from 1993 to 2012.

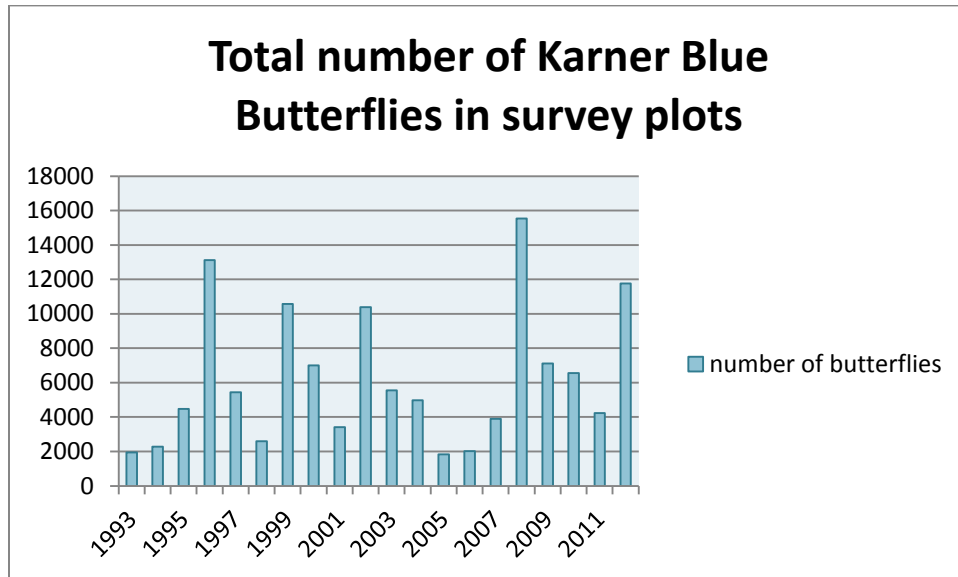


Figure 5. Estimation of the density of Karner blue butterfly population per acre of land on Necedah National Wildlife Refuge.

